

Dorothy E. Croall, PhD Professor of Biochemistry

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Education and Training:

Gettysburg College, PA	BA	Biology, Chemistry minor
University of Rochester School of Medicine & Dentistry, Rochester, NY	PhD	Biochemistry
Boston Biomedical Research Institute, Boston, MA	MDA postdoc	Biochemistry
UT Southwestern Medical Center, Dallas, TX	NIH-postdoc	Neurology/Molecular biology

Positions and Honors.

1973 Phi Beta Kappa

1982 -1987 Instructor, Physiology; UT Southwestern Medical School, Dallas TX

1988 - 1990 Research Assistant Professor, Physiology; UT Southwestern Medical School, Dallas TX

1990 - 2000 Associate Professor of Biochemistry; University of Maine, Orono, ME

1997 (September)- 1998 (June) Visiting Professor Queen's University, Kingston, Ontario, Canada

2000 –present Professor of Biochemistry; University of Maine, Orono, ME

2013 January - June Visiting Scientist at Maine Medical Research Institute, Scarborough Maine

Over the past 30+ years I have developed intimate knowledge of, and extensive expertise in, the biochemistry of calpains (isoforms 1 and 2) and calpastatin (CAST). I have isolated those proteins from natural tissue sources and a variety of recombinant calpain2 and CAST-dl variants expressed in E coli. Throughout my career I have been a creative, collaborative, and analytical contributor to the science of calpains. We have preliminary data sets resulting from *in vitro* affinity capture (AC) coupled with mass spectrometry (MS) to examine proteins from endothelial cell lysates that interact with calpain2. We are currently collaborating with Dr. J. Geddes, University of Kentucky in pursuit of understanding the basic biochemistry of calpain5, its interactome and its role in the central nervous system.

Sample publications related to

Purification and initial characterization of calpain1 and calpain2:

- Croall, D.E. and DeMartino, G.N. (1983) Purification and characterization of calcium-dependent proteases from rat heart. *J. Biol. Chem.* 258:5660-5665.
- DeMartino, G.N. and Croall, D.E. (1983) Purification and characterization of a calcium-dependent protease from rat liver. *Biochemistry* 22: 6287-6291
- Croall, D.E. and DeMartino, G.N. (1984) Comparison of two calcium- dependent proteases from bovine heart. *Biochim. Biophys. Acta* 788:348-355
- Croall, D.E. and DeMartino, G.N. (1986) Calcium-dependent affinity purification of transglutaminase from rat liver cytosol. *Cell Calcium* 7:29-39
- Croall, D.E. (2000) Affinity chromatography methods for purifying calpains. *Meth. Mol. Biol.* 144, 33-40 PMID: 10818745

Exploiting autoproteolysis as a marker for calpain activation

- Croall, D.E. (1989) Proteolytic modification of calcium-dependent protease-1 in erythrocytes treated with ionomycin and calcium. *Biochemistry* 28: 6882- 6888.

- Croall, D.E., Slaughter, C.A., Wortham, H.S., Skelly, C.M., DeOgny, L. and Moomaw, C. (1992) Polyclonal antisera specific for the proenzyme forms of each calpain. *Biochim. Biophys. Acta* 1121: 47-53. PMID:2057527

Characterization of the calpain2- calpastatin interaction

- DeMartino, G.N. and Croall, D.E. (1984) Purification and characterization of a protein inhibitor of the calcium-dependent proteases from rat liver. *Arch. Biochem. Biophys.* 232:713-720.
- DeMartino, G.N., Wachendorfer, R., McGuire, M.J. and Croall, D.E. (1988) Proteolysis of the protein inhibitor of calcium-dependent proteases produces active inhibitor fragments. *Arch. Biochem. Biophys.* 262:189-198.
- Croall, D.E. and McGrody, K.S. (1994) The domain structure of milli-calpain: Mapping the binding site for calpastatin. *Biochemistry* 33: 13223- 13230.
- Croall, D.E., Vanhooser, L.M. and Cashon, R.E. (2008) Detecting the Active Conformation of Calpain-2 with Calpastatin-Based Reagents. *Biochim Biophys Acta* 1784, 1676-1686, doi:10.1016/j.bbapap. 2008.08.013 PMID:18793761

Previous collaborative efforts:

- Potter, D.A., Tirnauer, J.S., Jansenn, R., Croall, D.E., Hughes, C.N., Mier, J., Maki, M. and Herman, I.M. (1998) Calpain regulates cell spreading and function of the cortical actin cytoskeleton. *J. Cell Biol.* 141, 647-662. PMID:9566966
- Hosfield, C.M., Ye, Q., Arthur, J.S.C., Hegadorn, C., Croall, D.E., Elce, J.S., Jia, Z. (1999) Crystallization and X-ray crystallographic analysis of m-calpain, a calcium-dependent protease. *Acta Cryst. D* 55, 1484-1486.
- Dutt, P., Croall, D.E., Arthur, J.S.C., DeVeyra, T., Williams, K, Elce, J.S. and Greer, P.A. (2006) m-Calpain is required for preimplantation embryonic development in mice. *BioMed Central Developmental Biology* 6, 3 PMID:16433929

Citations of career publications are accessible through NCBI- MYbiobibliography.

<http://www.ncbi.nlm.nih.gov/sites/myncbi/10W9slnSEug57/bibliograpahy/50050369>